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QUALIFY FOR THE FUTURE WORLD
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Level 1 Biology, 2015

90927 Demonstrate understanding of biological ideas relating to micro-organisms

2.00 p.m. Friday 20 November 2015
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to micro-organisms.	Demonstrate in-depth understanding of biological ideas relating to micro-organisms.	Demonstrate comprehensive understanding of biological ideas relating to micro-organisms.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Not Achieved

TOTAL 5

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QUESTION ONE: MICROBES AND ILLNESS

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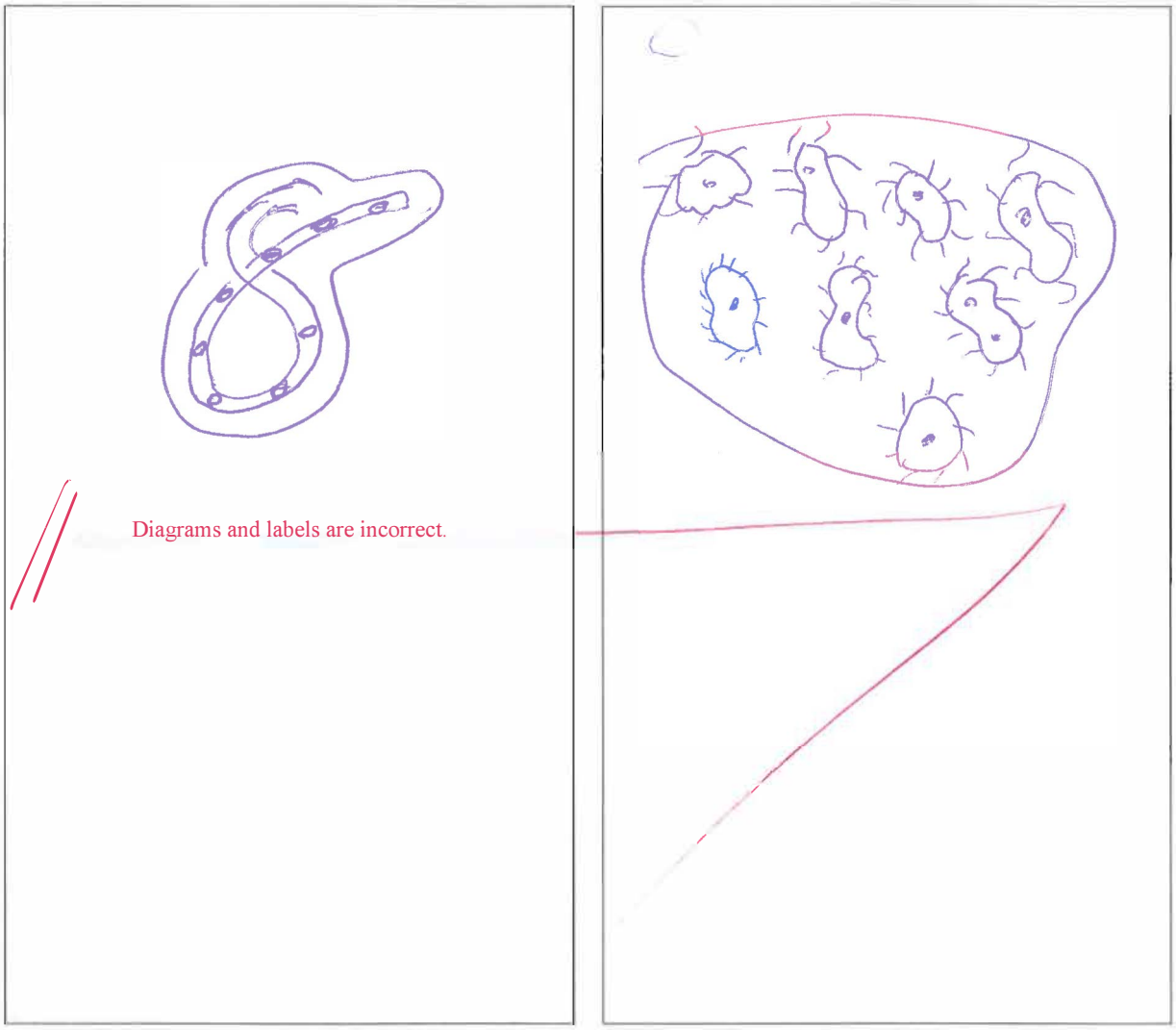
Two students, Manaaki and Angela, were sick and went to the doctor on the same day.

Manaaki was told that he had the common cold, which is caused by a viral infection, and was advised to stay home and rest.

Angela had a sore throat, which is caused by a bacterial infection, and was prescribed a 10-day course of antibiotics.

(a) Draw labelled diagrams of a virus and a bacterium.



Diagrams and labels are incorrect.

(b) The symptoms developed very differently for Manaaki and Angela before they saw the doctor.

Manaaki's symptoms (caused by a virus) had become worse suddenly in the morning, while Angela's symptoms (caused by bacteria) became worse gradually throughout the day.

Explain why Manaaki developed the symptoms more quickly than Angela.

In your answer you should:

- explain how the reproduction of viruses and bacteria affected how quickly Manaaki and Angela developed the symptoms
- compare and contrast the way viruses and bacteria reproduce, including their requirements of energy.

speed of reproduction described.

Manaaki developed the symptoms more quickly because viruses work alot faster than bacterial symptoms. The reproduction of viruses and bacteria affect how quickly the two developed the syptoms because viruses spread alot faster and are contageous where as bacteial can't really be spread. Viruses feed on body cells where as bacteria feed on energy

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(c) Angela was prescribed antibiotics to help her get better. Some bacteria can become resistant to some antibiotics.

Explain how antibiotics work on bacteria and how bacteria can become resistant to antibiotics.

In your answer you should:

- explain how life processes of bacteria can be affected by antibiotics
- explain how bacteria can develop antibiotic resistance if Angela did not complete her 10-day course of antibiotics
- explain how this process might affect Angela's symptoms.

bacteria can be affected by antibiotics because antibiotics kills all the harmul germs, ~~another~~ bacteria can become resistand from antibiotics because they can ~~disg~~ disguise themselves as a helpful cell. This process affects Angelas Syptoms because the antibiotics can't kill the germs if the cant be found.//

QUESTION TWO: THE SCIENCE OF MAKING BREAD

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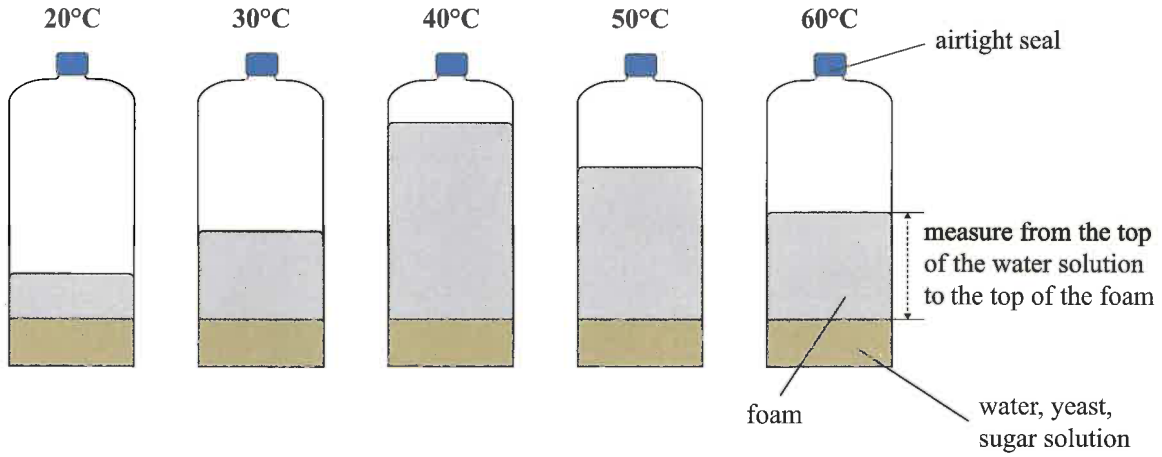
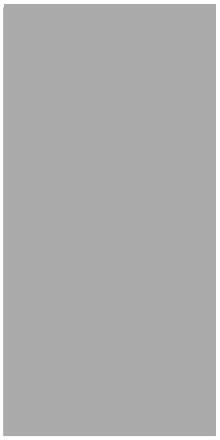
The following experiment was set up by a group of Year 11 students who wanted to investigate respiration in fungi (yeast) cells. When fungi (yeast) are mixed with sugar and water, foam forms, and may be measured to indicate the amount of carbon dioxide produced.

Year 11 Fungi Respiration Experiment



The type of yeast the students used was dried active yeast.

The instructions say to refrigerate the container after opening. There is an **airtight** seal on the top of the container under the lid that must be removed before use.



http://www.hellokiwi.co.nz/index.php?route=product/product&product_id=231

Discuss what the students can determine about respiration from their experiment.

In your answer you should:

- describe three conditions required for the growth of fungi (yeast)
- describe anaerobic respiration
- explain how fungi (yeast) gain their nutrients
- identify the optimal temperature for growing fungi (yeast) as shown in the experiment above, and explain how this can be applied to the production of bread and the storage of fungi (yeast)
- discuss the importance of keeping the fungi (yeast) sealed and refrigerated once opened.

Fungi n (yeast need warm conditions and feed on the sugar too grow larger, the more sugar they feed on the more CO^2 is heat released into the air. The temperature to grow fungi is ~~25°C~~ 60°c 40°c. It is important to keep the fungi sealed after opening

because the longer it is open the more CO^2 that is being released into the air//

Production of CO_2 and Optimal temperature descibed.

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QUESTION THREE: A PILE OF COMPOST

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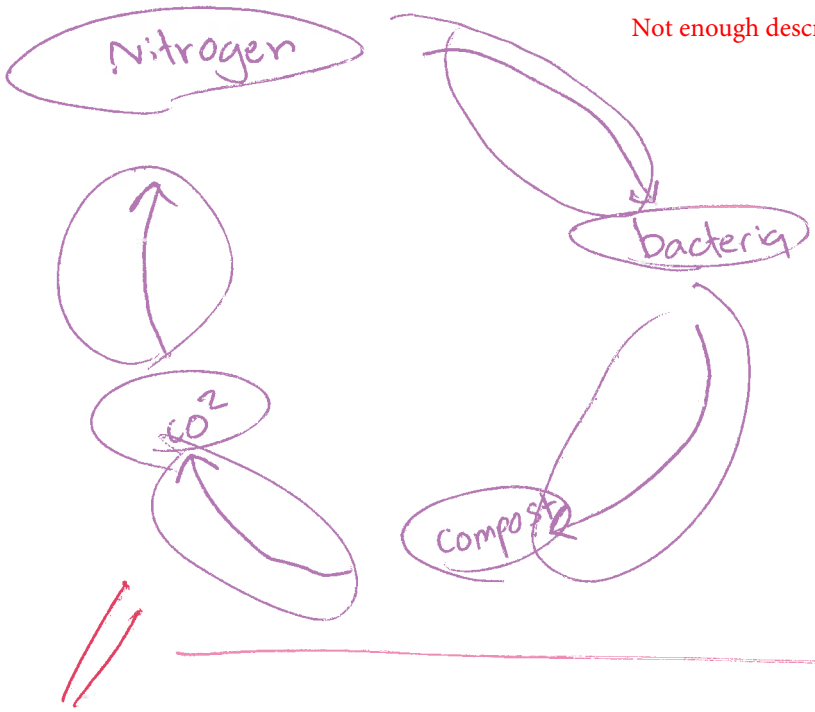
Compost is decayed organic matter. Composting is the process carried out by bacteria, turning organic matter such as vegetable matter and manure into compost. A successful compost heap requires good air flow.

Bacteria play a big part in the nitrogen cycle and the carbon cycle.

(a) Draw a labelled diagram of the nitrogen cycle that shows the role of **bacteria** in this cycle.

The Nitrogen Cycle



Not enough descriptions of the nitrogen cycle

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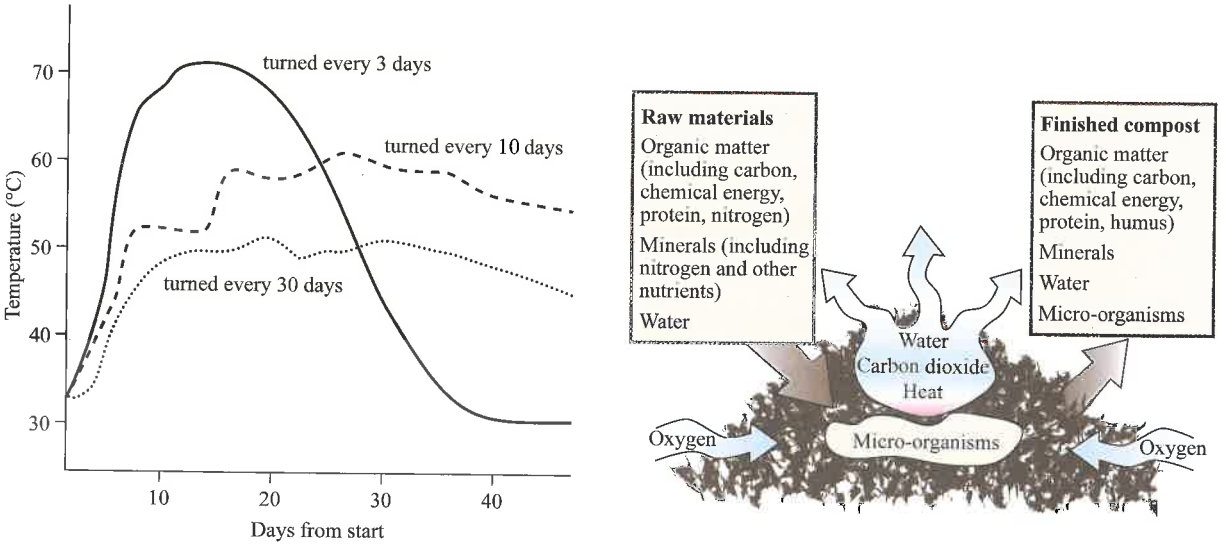
(b) **The Carbon Cycle: How the frequency of turning the compost affects its temperature over a period of 40 days**



Adapted from: http://goo.gl/sVfgZ

Discuss the role that microbes play in releasing carbon dioxide from the compost heap shown above.

In your answer you should:

- name the type of bacteria involved in breaking down the dead and decaying organic material
- describe how the frequency of turning the compost changes the temperature of the compost, as shown on the graph above
- explain the effect of turning over the compost heap on the microbes, using the information from the graph above.

The bacteria that breaks down the dead and decaying organic material is a type of bacteria called ..... When the compost is turned over the temperature of the compost changes looking at the graph every 10-30 days the temperature of the compost rises but when it was flipped ever 3 days the temperature dropped because

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the microbes and bacteria didn't have enough time to break it down ~~wolsic~~ ~~real~~ releasing CO^2 into the air and heat causing the compost to be warm.

The protein from the Raw material is eaten by the bacteia including nutrients and mitrogen and the bacteria then releases eg CO^2, water and heat out.

Correct idea about bacteria respiration products

(c) Analyse the importance of the bacteria in cycling carbon and nitrogen in the compost heap.

Bacteria plays a big role in the ~~tycling~~ carbon cycle because bacteria breaks down the food and releases CO^2 into the air for the trees to take in and turn it into oxygen.

correct description of one aspect of the carbon cycle

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Extra paper if required.
Write the question number(s) if applicable.

QUESTION NUMBER

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